

EXHIBIT A

IN THE UNITED STATES DISTRICT COURT
IN AND FOR THE DISTRICT OF DELAWARE

TRUEPOSITION, INC., : CIVIL ACTION
Plaintiff :
vs. :
ANDREW CORPORATION, :
Defendant : NO. 05-747 (SLR)

Wilmington, Delaware
Tuesday, April 10, 2007
8:30 o'clock, a.m.

BEFORE: HONORABLE SUE L. ROBINSON, Chief Judge

APPEARANCES:

CONNOLLY, BOVE, LODGE & HUTZ LLP
BY: JAMES D. HEISMAN, ESQ.

-and-

WOODCOCK WASHBURN LLP
BY: PAUL B. MILCETIC, ESQ.,
KATHLEEN MILSARK, ESQ. and
DANIEL J. GOETTLE, ESQ.
(Philadelphia, Pennsylvania)

Counsel for Plaintiff

Valerie J. Gunning,
Official Court Reporter

1 In Slide 86, you see it. This is the first two blocks
2 after the first four I showed you earlier. We're already
3 calculated T-DOA data, that it's calculated and you
4 calculate it lat/lon for each signal.

5 And then the rest of our construction, the same
6 principles.

7 If you go to the patent, you will see portions
8 of Figure 8C and 8D disclose more of those blocks in more
9 detail. Why did we delete frequency arrival? Because it
10 related frequency velocity, not location. The velocity
11 in this case is cell phone location. Why do we include
12 equivalents? Because that's from the statute.

13 THE COURT: All right.

14 MR. MILCETIC: I could go through their
15 structure and why it's not correct.

16 THE COURT: Well, their structure is several
17 columns of material; right?

18 MR. MILCETIC: It's -- I would say that you
19 could follow what I just said and apply it and you would
20 get the idea of what our position is.

21 THE COURT: All right. Mr. Parks, why don't
22 you respond.

23 MR. PARKS: Your Honor, I was just trying to
24 simplify this.

25 What's important for the means for processing

1 limitation is that it specify that it requires cross-
2 correlation function and I believe from the charts that
3 TruePosition has just shown that they would agree that the
4 means for processing requires cross-correlation function.
5 That is what is key about that limitation and it's the
6 easy way to simplify the construction for it.

7 And, yes, the plus equivalents.

8 In terms of the means for determining, what
9 is important here, again, what is key to the construction
10 is that the construction specify that the means for
11 determining require a least squares estimate equation and
12 that is set forth in Column 16 of the patent, under the
13 title location calculation.

14 And in the middle of that page, it sets forth
15 the equation for the least squares estimate. And, again,
16 that's what is key for the means for determining
17 limitation that the construction specified that it
18 requires the least squares estimate equation as specified
19 in the '144 patent itself.

20 I'm, frankly, not sure this requires any more
21 detail than that.

22 MR. MILCETIC: Your Honor, if I might just
23 respond to that briefly, I think there's no dispute about
24 what he's saying. I just went through an analysis of how
25 you construe means for processing. If you don't mind, I

1 will go up here.

2 There's a block that says cross-correlate data.
3 If what he's saying is, please cross-correlate data, that's
4 what it says: Cross-correlate data.

5 THE COURT: All right. Any other claim
6 limitations that we should discuss before we take a short
7 break and go into the motion?

8 MR. PARKS: Your Honor, if we could briefly
9 go over the limitations that speak of the time stamp
10 bits...

11 THE COURT: All right.

12 MR. MILCETIC: All right. Now, there is
13 one means-plus-function claim that we didn't specifically
14 address, which is in Claim 22.

15 We can do that first?

16 THE COURT: That's fine.

17 MR. MILCETIC: It might be worth it, just to go
18 through it.

19 It's this automatically determining the
20 locations of said cellular telephones. It's in Claim 22,
21 the middle element. Essentially, three elements in Claim
22 22.

23 Automatically determining the locations of
24 said cellular telephones by receiving and processing
25 signals emitted during said periodic reverse control

1 channel transmissions.

2 Now, that one, essentially our function --
3 first of all, this is one where we differ on the function.
4 If you look at Andrew's function here, I'm not sure where
5 it's coming from. None of this is up for construction
6 and essentially, there's a basic principle that says you
7 follow the recited function when you identify a function
8 and they didn't do that.

9 So that's the first thing I think you should
10 do.

11 And there is a case on Slide 892. 112,
12 Paragraph 6. It does not permit the limitation of a
13 means-plus-function claim by adopting a function different
14 from that explicitly recited in the claim.

15 If they wanted to construe those terms, they
16 could have designated terms to construe for you. They
17 want to change that language.

18 Next, the structure. We are pointing to the
19 first six blocks in Figure 7 this time because if you
20 look at the structure of Claim 22, Claim 21 has two parts,
21 two pieces of software recited: A means for generating
22 T-DOA and then a means for determining the location based
23 on T-DOA.

24 Well, this claim, 22, has both of those
25 wrapped up into one. It's just got one piece of software

1 that says locating means for determining. And so we
2 thought it was logical to essentially point to a
3 combination of the two structures that we pointed to for
4 Claim 1 and that we went into the first four blocks of
5 Figure 7 plus two blocks of Figure 7.

6 And then the other principles, again, that I
7 had mentioned earlier.

8 So if you look at Figure 7 on Slide 94, now we
9 have the first six blocks of Figure 7. Those six blocks
10 end in a -- a block that says calculate the lat/lon for
11 each signal. That's the lat/lon for the telephone.
12 That's what the patent is all about, determining location
13 of the cell phone and the recited function is locating
14 means for automatically determining locations of the
15 cellular telephone.

16 So that's it. That's what does that.

17 And we disagree with Andrew's construction for
18 exact same reasons. In other words, since -- you think of
19 it this way. Since the means-plus-function for Claim 1,
20 there are two parts, and since for Claim 22, I am
21 addressing now, it's those two combined, the arguments we
22 make are similar. We then say that Figure 8, which is in
23 greater detail, which disclose that greater, should also
24 be incorporated if you want to be legally correct.

25 And we disagree with including frequency

1 difference of arrival, all that stuff. Just the same
2 principles again. And it's in our brief.

3 THE COURT: Do you want to go on to the time
4 difference?

5 MR. MILCETIC: Sure. Time difference.

6 Well, I will tell your Honor in terms of
7 simplifying it, I will tell you how I would simplify this.
8 There are six terms that, as far as I can tell, well, for
9 five of the six at least, Andrew has provided no evidence
10 whatsoever that -- in other words, they provide a
11 different set of words that you should incorporate into
12 the claim and they provide essentially no evidence
13 whatsoever for why it also that you should do that.

14 And there's a line of cases that I think that
15 deal with these six terms, one of which he just raised.
16 And they've been decided since Phillips, actually.
17 They're recent. And that is the Wilson Sporting Goods,
18 for example, a recent case. And what the Federal Circuit
19 said, that where nothing -- this is, I think, the
20 controlling principle. This is going to simplify this for
21 you when you look at the briefs.

22 Where nothing in the specification, for like
23 five terms that we just listed -- where nothing in the
24 spec indicates that the inventor intended to impart a novel
25 meaning and the record contains no evidence that the term

EXHIBIT B

Oded Gottesman Report:

0. EXPERT REPORT OF ODED GOTTESMAN, Ph.D.

EXPERT REPORT OF ODED GOTTESMAN, Ph.D.

My name is Oded Gottesman, and I was asked to write this report by TruePosition, Inc. ("TruePosition"). I was specifically asked to consider whether Andrew Corporation ("Andrew") has infringed U.S. Patent 5,327,144 (the '144 Patent). I understand that TruePosition has sued Andrew for infringement of U.S. Patent 5,327,144 (the '144 Patent). I have been retained by TruePosition because of my expertise in the areas of telecommunications, computer programming, signal processing, speech coding, and transmission over networks, including radio communications in cellular networks.

This report considers the '144 Patent, and my opinion that Andrew infringes the 144 Patent because the 144 Patent claims encompass configurations of Andrew's Mobile Location System product known as the "Geometrix[®] Wireless Location System."

I. Summary of My Opinions

Based upon my 19 years of experience in the signal processing and telecommunications industry, I believe that Andrew has infringed Claims 1, 2, 22, 31, and 32 (the "Asserted Claims") of the '144 Patent by using and offering to sell certain configurations of its Geometrix[®] Wireless Location System, and by supplying from the United States the components of the Geometrix[®] Wireless Location System.

More specifically, in December 2004, Andrew infringed Claims 1 and 2 of the 144 Patent by offering for sale within the United States a configuration of the Geometrix[®] Wireless Location System to Saudi Telecom Company ("STC"), a cellular telephone network operator in Saudi Arabia.

In about August/September 2005, Andrew also infringed Claim 31 of the 144 Patent by using within the United States a configuration of the Geometrix[®] Wireless Location System at a demonstration at its Ashburn, Virginia, facility.

Between October, 2005 and February, 2006, Andrew again infringed Claims 1 and 2 of the 144 Patent by offering for sale configurations of the Geometrix[®] Wireless Location System to STC.

After October, 2005, Andrew also repeatedly infringed Claims 1, 2, 22, 31 and 32 of the 144 Patent by supplying from the United States to Saudi Arabia components of a system comprising a combination of Andrew's Geometrix[®] Wireless Location System and STC's cellular telephone system, and by supplying components of a method performed during the operation of that combination system.

After October, 2005, Andrew also repeatedly infringed Claims 1, 2, 22, 31 and 32 of the 144 Patent by supplying from the United States to Saudi Arabia components of a system comprising a combination of Andrew's Geometrix[®] Wireless Location System, STC's cellular telephone system and a Location Based Services database owned or operated by STC, and by supplying components of a method performed during operation of that combination system.

Oded Gottesman Report

III. The Bases and Reasons for My Infringement Opinions

that determines, on the basis of the differences in times of arrival, the locations of the cellular telephone responsible for the standalone dedicated control channel signals.⁹¹

The algorithm in the patent that performs this function is described connection with portions Figures 7, and portions 8C-8D which are nicely summarized in the fifth and sixth blocks of Figure 7. The same or equivalent functionality in the GCS has already been described in this report. Specifically, after the TDOA table data is filtered, the *FixMix* function uses that data to determine the location of the cellular phones. *FixMix()* performs an iterative computational process which is the same or equivalent to weighted-least-squares (WLS) iteration in the '144 Patent.⁹² Such a technique (Weighted Least Squares) is aimed at achieving the Maximum Likelihood (ML) estimate which maximizes the probability that a particular estimate is the correct position.⁹³ As is well known, large numbers of Weighted Least Squares measurements used in the iterative computational process increases the accuracy of the position estimation and both *FixMix()* and the Weighted least squares technique use this iterative computation technique. Therefore, the programmed computer processor in the GCS is the same or equivalent structure as this claim element. For same reason it performs the identical function.

In conclusion, it is my opinion that all the elements of claim 1 are literally included in the Geometrix system offered to STC.

E.2.2 CLAIM 2 OF THE '144 PATENT**E.2.2.1 Claim 2 Recitation**

A cellular telephone location system as recited in claim 1, wherein said timing signal receiver comprises a global positioning system (GPS) receiver.

⁹¹ See AND0021416 – AND0021426, “*FixMix()*”; PX-218, at 13 of 55 noting that the GCS “calculates location estimates based on measurements made by LMU’s”; AND_EF134186, noting that “by calculating the difference in arrival time at pairs of cell sites, it is possible to calculate hyperbolas on which the transmitting device is located”; 10/14/06 Deposition Transcript of Alan Li [37] at p. 70, l. 13 – p. 73, l. 15.

⁹² See Ilan Ziskind and Mati Wax, “Maximum likelihood localization of multiple sources by alternating projection,” IEEE Trans. ASSP, Vol. 36, No. 10, pp.1553 – 1560, October 1988; Mati Wax and Ilan Ziskind, “On unique localization of multiple sources by passive sensor arrays,” IEEE Trans. ASSP, Vol. 37 No. 7, pp. 996-1000, July 1989; Bin Yang, “Projection approximation subspace tracking,” IEEE Trans SP, Vol. 43 No. 1, pp. 95-107, January 1995; Michaela C. Vanderveen, et. al., “Joint Angle and Delay Estimation (JADE) for Multipath Signals Arriving at an Antenna Array,” IEEE COMMUNICATIONS LETTERS, VOL. 1, NO. 1, pp.12 - 14, JANUARY 1997; Nilesh Agarwal Leena Chandran-Wadia Varsha Apte, “CAPACITY ANALYSIS OF THE GSM SHORT MESSAGE SERVICE,” Indian Institute of Technology Bombay, www.cse.iitb.ac.in/~varsha/allpapers/wireless/ncc03cam.pdf, 2003; John D. Bard and Fredric M. Ham, “Time Difference of Arrival Dilution of Precision and Applications,” IEEE TRANSACTIONS ON SIGNAL PROCESSING, VOL. 47, NO. 2, p.521-3, FEBRUARY 1999; K. C. Ho, and Wenwei Xu, “An Accurate Algebraic Solution for Moving Source Location Using TDOA and FDOA Measurements”, IEEE TRANSACTIONS ON SIGNAL PROCESSING, VOL. 52, NO. 9, SEPTEMBER 2004.

⁹³ See AND_EF134186.

Oded Gottesman Report

III. The Bases and Reasons for My Infringement Opinions

The third clause of Claim 22 is: **“(b) locating means for automatically determining the locations of said cellular telephones by receiving and processing signals emitted during said periodic reverse control channel transmissions; and”**

This element is satisfied by the computer processor in the GCS, and the algorithms running on the computer processor, including the code in the PreFixMix and FixMix function, that determines the locations of the cellular phones by receiving and processing the DF_RESULTS_MSG frames received from the installed LMU's/WLS's.¹⁶⁰

The algorithm in the patent that performs this function is described connection with portions of Figures 7, and portions 8A-8D which are nicely summarized in the portion of Figure 7 through latitude/longitude calculation. The same or equivalent functionality in the GCS has already been described in this report. Specifically, The GCS receives DF_RESULTS_MSG with TOA data (recv.c), unpacks the frames, compares frames with other frames to determine whether signals belong to the same cell phone, and generates a TDOA table in the *PreFixMix* function. After the TDOA table data is filtered, the FixMix function uses that data to determine the location of the cellular phones. *FixMix()* performs an iterative computational process which is the same or equivalent to weighted-least-squares (WLS) iteration in the '144 Patent.¹⁶¹ Such a technique (Weighted Least Squares) is aimed at achieving the Maximum Likelihood (ML) estimate which maximizes the probability that a particular estimate is the correct position.¹⁶² As is well known, large numbers of Weighted Least Squares measurements used in the iterative computational process increases the accuracy of the position estimation and both FixMix() and the Weighted least squares technique use this iterative computation technique. Therefore, the programmed computer processor in the GCS is the same or equivalent structure as this claim element. For same reason it performs the identical function.

¹⁶⁰ See, e.g., AND0019024 – AND0019038, AND0020896 – AND0021962, AND0022177 – AND0023010; PX-63 at 13 of 55 noting that the GCS “calculates location estimates based on measurements made by LMU's.”

¹⁶¹ See Ilan Ziskind and Mati Wax, “Maximum likelihood localization of multiple sources by alternating projection,” IEEE Trans. ASSP, Vol. 36, No. 10, pp.1553 – 1560, October 1988; Mati Wax and Ilan Ziskind, “On unique localization of multiple sources by passive sensor arrays,” IEEE Trans. ASSP, Vol. 37 No. 7, pp. 996-1000, July 1989; Bin Yang, “Projection approximation subspace tracking,” IEEE Trans SP, Vol. 43 No. 1, pp. 95-107, January 1995; Michaela C. Vanderveen, et. al., “Joint Angle and Delay Estimation (JADE) for Multipath Signals Arriving at an Antenna Array,” IEEE COMMUNICATIONS LETTERS, VOL. 1, NO. 1, pp.12 - 14, JANUARY 1997; Nilesh Agarwal Leena Chandran-Wadia Varsha Apte, “CAPACITY ANALYSIS OF THE GSM SHORT MESSAGE SERVICE,” Indian Institute of Technology Bombay, www.cse.iitb.ac.in/~varsha/allpapers/wireless/ncc03cam.pdf, 2003; John D. Bard and Fredric M. Ham, “Time Difference of Arrival Dilution of Precision and Applications,” IEEE TRANSACTIONS ON SIGNAL PROCESSING, VOL. 47, NO. 2, p.521-3, FEBRUARY 1999; K. C. Ho, and Wenwei Xu, “An Accurate Algebraic Solution for Moving Source Location Using TDOA and FDOA Measurements”, IEEE TRANSACTIONS ON SIGNAL PROCESSING, VOL. 52, NO. 9, SEPTEMBER 2004.

¹⁶² See AND_EF134186 .

EXHIBIT C

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UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

- - -
TRUEPOSITION, INC.,)
Plaintiff/Counterclaim)
Defendant,)
)
vs.) C.A. No. 05-00747-SLR
)
ANDREW CORPORATION,)
Defendant/)
Counterclaim Plaintiff.)
_____)

VIDEOTAPED DEPOSITION OF ODED GOTTESMAN, Ph.D.

VOLUME II

Philadelphia, Pennsylvania

Friday, January 12, 2007

9:12 a.m.

Job No.: 25500261

Pages: 285 - 451

Reported By: Debra A. Whitehead

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1 together, and saying least squares difference
2 equation, and so on, it is under -- it is very clear
3 to skill in the art to understand what they meant.

4 And they meant this is the equation that
5 define our distortion measure, and this is the -- or
6 "difference," sometime people call it -- and this is
7 our objective to minimize.

8 And we would -- we are looking for the
9 point where this achieve its least value. And that
10 point, for us, would be where the location of the
11 phone is, the minimum of the function.

12 So if you try to make me take one -- one
13 word out of context and to say, but in other place it
14 means something else, no. Altogether, that what it
15 means.

16 Q What is maximum likelihood estimate?

17 A Maximum likelihood estimator is an
18 estimator that -- it's a term from probability that is
19 an estimator that is aimed to maximize the likelihood
20 probability.

21 So if you define, this is my likelihood
22 probability, then in certain environment, in certain
23 condition, in certain assumptions, in certain
24 probabilities, I get the details of a problem that,
25 when I solve it or maximize the probability, I would

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1 achieve the objective of maximum likelihood.

2 Q Dr. Gottesman, can you please draw for me
3 on the piece of paper I will hand you the equation for
4 maximum likelihood estimate.

5 A Sure.

6 Okay. This is what it is.

7 MR. PARKS: Would you please mark this as
8 the next exhibit.

9 (Document marked for identification as
10 Gottesman Exhibit 17.)

11 BY MR. PARKS:

12 Q We have marked as Gottesman Exhibit 17 the
13 equation that you have just drawn.

14 Is it your testimony that the equation that
15 you have drawn on Gottesman Exhibit 17 is in fact the
16 equation for maximum likelihood estimate?

17 A Uh-huh.

18 Q Could you please also write on Gottesman
19 Exhibit 17 what each of the variables in the equation
20 mean?

21 A (Witness complies with request.)

22 Q Could you also, please, Dr. Gottesman,
23 demonstrate for me mathematically or otherwise how, in
24 your opinion, maximum likelihood estimate is
25 equivalent to least squares estimation.

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1 A I did not say that it is equivalent; I said
2 that it is aimed to achieve under -- it -- on the
3 general sense, it is not the same thing. Under
4 certain conditions, it is aimed to achieve the same
5 thing.

6 And the conditions are that the observation
7 noise, for example, of Gaussian distribution, and they
8 are independent, and they are -- and they have zero
9 mean, and there -- certain -- certain assumption that
10 you have to make in order to say. So, in a sense,
11 what I am doing here is actually aimed to maximize the
12 likelihood.

13 Maximum likelihood is a term in
14 probability. You cannot -- and you can define
15 "probability" in different ways.

16 When it comes to computer, you need to have
17 an algorithm that you implement and is visible to
18 implement on computer, so you need to define certain
19 distortion. Because a program on the computer, an
20 algorithm that is implemented, can do certain
21 calculations, can minimize certain distortions. So
22 you have first to define a visible distortion measure.

23 So what the inventor have done here, they
24 defined a visible distortion measure. Under certain
25 conditions, minimizing that distortion measure is

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1 equivalent to maximizing likelihood, in probability.

2 Q What are those conditions?

3 A For example, that the observation have
4 Gaussian, G-A-U-S-S-I-A-N, distribution, I believe so,
5 distribution, zero mean, M-E-A-N, and independent.
6 And there is also some assumption related to the
7 occurrence of an observation or occurrence of
8 location.

9 So, for simplicity, maximum likely --
10 minimizing this distortion, minimizing this
11 distortion -- and that's what's done in a software and
12 that what is done in the patent.

13 So let me -- let me, maybe, clarify it.
14 Maximum likelihood is not mentioned in the patent.
15 Maximum likelihood, I am not sure if mentioned in the
16 product, but it's not what the source code -- the
17 source code does not use -- it does not implement
18 exactly an algorithm, you know, that, for example,
19 measure infinite number of probability value that
20 asymptotically, you know, reach certain value,
21 something like that.

22 We perform one measurement, and then we
23 need to calculate the location. That what it is, that
24 what the system has to do. We are not talking about
25 any theoretical situation, you know, that, under

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1 different condition, maximum likelihood may mean
2 something else.

3 So in the patent there is a weighted
4 minimum distortion that the inventor suggested to
5 minimize. In the product there is the same thing, the
6 same weighted distortion minimize.

7 Where maximum likelihood came from, it only
8 came from a document that -- that Andrew wrote and
9 characterized what their product does. But the source
10 code minimizes a weighted distortion measure, that's
11 where it is.

12 Now, in fact, the inventors -- and I read
13 their deposition -- they -- they -- I believe, it
14 appeared to me, that they were aware of the fact that,
15 under certain condition that are commonly taken, such
16 as, Gaussian, zero mean and so on, in fact this is the
17 most likely location.

18 And if you look at the inventor --
19 inventors -- and I believe I clearly remember Webber,
20 but maybe also Curtis -- they clearly use the term
21 "most likely," that the location is the most likely
22 location.

23 So, in their mind, they understood that
24 minimizing that weighted distortion measure is, under
25 certain condition that are typically taken, such as

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1 those I mentioned, it is aimed or equivalent to
2 maximum likelihood.

3 But, what they implemented is this. And
4 that's what's in the patent. And the probability
5 aspect of that is not really relevant to the equation
6 and what's in the product. These are both minimizing
7 the same distortion.

8 The fact that, in addition to this
9 distortion, under certain condition, it also has
10 aspect related to probability and maximum likelihood,
11 that's a different story.

12 But that's not what makes the product and
13 the patent related. What makes it related is both
14 minimize that weighted distortion measure.

15 Q In situations where the observation does
16 not have Gaussian distribution and there's not a zero
17 mean and no independence, as you referred to --

18 A It's a different assumption. Okay.

19 Q -- under those conditions, you would agree,
20 wouldn't you, that maximum likelihood estimate is not
21 equivalent to least squares estimation; right?

22 A No, I would not agree. I have to see the
23 numbers, I have to see everything in front of me, and
24 then I can consider it. I don't want to speculate on
25 that.

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1 I just told you what's in the product and
2 what's in the patent. And what I told you, that, in
3 addition to that, people sometime -- or often makes
4 the assumption of Gaussian and others. And, under
5 this condition, they characterizes what they do as
6 equivalent to maximum likelihood.

7 But it could be that, in certain product,
8 the probability is in fact not exactly Gaussian, but
9 very close to Gaussian.

10 And, you know, it may be even different --
11 different Gaussian on different times because the
12 temperature of the system had changed.

13 So people that implement an algorithm,
14 they're looking for something they can implement. So
15 when people put that distortion measure, that's a
16 distortion measure that, number one, is visible and
17 easy to calculate, and there are solution for it. And
18 I can show you, for example, how that distortion
19 measure is related to the probability that we assume.

20 So if we assume, for example, maximum
21 likelihood, that has -- and we assume Gaussian and so
22 on, I can show you exactly how this distortion is
23 related to that Gaussian equation.

24 Q Can you show me, please, on --

25 A Yes.

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1 to minimizing the exponent because of the minus sign
2 in the exponent.

3 If you take something in -- in its
4 exponent, and you looking for the minimum, then you
5 have to look what it -- at the exponent. If the
6 exponent has a minus sign, then you need to minimize
7 that in order to maximize the whole thing.

8 Q So --

9 A Maximizing the probability is equivalent to
10 minimizing what in the exponent of that probability.

11 Q And the exponent of the probability you are
12 referring to is the inverse of the covariant variable;
13 is that right?

14 A The whole thing that is in exponent.

15 Q Can you --

16 A It includes the inverse of the covariance
17 matrix, yes.

18 Q Could you please state for the record each
19 of the variables that you are including within the
20 exponent?

21 A In the exponent?

22 Q Yes.

23 A There are -- the exponent includes minus
24 half the vector N transpose, times the inverse of the
25 covariance matrix, times the vector N .

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1 Q Does the equation and words and everything
2 else that you have set forth on Gottesman Exhibit 18
3 set forth the entirety of your opinion as to how least
4 squares estimation is equivalent to maximum likelihood
5 estimate?

6 A Under certain condition, under certain
7 conditions, they -- they -- minimizing least squares
8 error, distortion, or measure is equivalent to
9 maximizing a probability, maximizing the likelihood,
10 under certain condition.

11 This conditions are usually taken by
12 researchers and scientists because it's a very useful
13 tool. There are a lot of useful mathematical tools
14 that people are aware of and people typically use and
15 utilize.

16 And whether the actual variables have
17 exactly Gaussian distribution or only approximately
18 Gaussian distribution, that's a different issue.

19 That's an issue of the scientist and the
20 researcher in deciding whether his assumption is -- is
21 good enough for his application. If it's good enough,
22 then you can do that.

23 Now, this is an academic and theoretical
24 discussion that I explained to you why scientists view
25 maximum likelihood as associated with minimizing the

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1 distortion measure. But that's only an academic
2 discussion.

3 This is not something you can implement in
4 a code, in a source code. It's not max -- there is no
5 limitation, there is no such algorithm of maximum
6 likelihood that include all this equation in the
7 source code. In the patent you have that distortion,
8 and also in the product there is this distortion.

9 The inventors were aware of the association
10 or the relation between minimizing such distortion and
11 maximum likelihood. And they said the observation is
12 the most likely location -- you can see through the
13 deposition many times, that what I believe they meant,
14 that it is closely related.

15 And typically scientists are aware of that.
16 This is very basic thing that you learn in even
17 undergrad.

18 And -- and --

19 MR. MILCETIC: Hold it. Can we --

20 A (Continued.) And --

21 MR. PARKS: No.

22 A -- the only place that -- so this is not
23 what the patent and what the product. The only place
24 in this context that maximum likelihood is mentioned
25 is in one of Andrew's document, that this is how they

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1 chose to characterize their product.

2 And I only added that to my report as an
3 intuition. It is not why the product is related to
4 the patent. I only added that as a comment to
5 supplement, to give the reader additional intuition.

6 So if you tried to show that, because I
7 used that, there could be, under different assumption,
8 some situation where it is not exactly this, so what?
9 So somebody made this assumption, and this what he had
10 in mind.

11 But this is not what the patent and the
12 product is about. The patent is about minimizing that
13 distortion and using algorithm to minimize it. And
14 that's why it is, under certain assumption, related to
15 maximum likelihood.

16 Q And in your prior answer, when you are
17 referring to product and source code, you are
18 referring to the Geometrix products and the Geometrix
19 source code; correct?

20 A Yes, that is correct.

21 Q Could you please write for me --

22 A And when I refer to the patent, I am
23 referring to the '144.

24 Q Thank you.

25 Could you please write for me on Gottesman

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1 Exhibit 18 the conditions under which you opine that
2 minimizing least squares is equivalent to maximizing
3 the likelihood estimation.

4 A Now, one -- one condition is that -- is
5 Gaussian --

6 MR. MILCETIC: I am just going to say, we
7 should make the record clear. Right? Do you want to
8 do it on a separate piece of paper?

9 MR. PARKS: No; he can put it on that piece
10 of paper. That's fine.

11 MR. MILCETIC: Okay.

12 BY MR. PARKS:

13 Q You can -- in fact, Dr. Gottesman, to make
14 it clearer, if you could put a heading over it that
15 says, conditions under which --

16 MR. MILCETIC: Good idea.

17 A Maybe put different note.

18 Q In other words, what Mr. Milcetic is saying
19 is, if you could label what you are writing on the
20 exhibit, so it is clear what it is that you are
21 writing.

22 MR. PARKS: Would this be a good time to
23 take a break, while you are doing that? We have been
24 going for a while.

25 I know you haven't had a chance to, you